

Today's objectives:

- **Generalizing rules**
- **Introduction to phonemes, allophones (LING 101 review)**

Background preparation:

- *Data set – Turkish suffixes (PP)*
- *Handout on formalizing rules*

0. Today's plan

- Follow-up on the Turkish genitive discussion
 - How does our model describe phonological processes?
 - What is some evidence from Turkish for modeling segments and segment classes with features?
- LING 101 review: Introduction to phonemes and allophones

1. Analyzing morpheme alternations

- Checking in on the prep questions (Turkish)
 - What makes the set of rules we had at the end of class last time (on Canvas) better than the alternative versions in the prep questions?
 - Why does rule (1) need to refer to [+hi], and does rule (2) also need to refer to [+hi]?
 - How can we state a more general analysis that only requires 2 rules instead of 3?
- Let's discuss these questions one at a time (although they are also connected!)

2. Morpheme alternations in our model

- Fact about the world: Some morphemes have more than one surface form
 - Assume we have confirmed that the pattern is productive (extends to new words, etc.)
- How does our **model** of the phonological grammar account for this kind of pattern?
 - What is stored in the mental lexicon?
 - How does the grammar produce the various surface forms?

2. Morpheme alternations in our model

- How does our **model** of the phonological grammar account for this kind of pattern?
 - What is stored in the mental lexicon?
 - A single UR for each alternating morpheme
 - How do we decide what that UR should be?
 - How does the grammar produce a surface form that is...
 - the **same** as the UR?
 - **not** the same as the UR?

2. Morpheme alternations in our model

- How does our **model** of the phonological grammar describe speech sounds?
 - Why? What facts about the world is this proposal designed to **describe, predict**, and hopefully **explain**?

2. Morpheme alternations in our model

- How does our **model** of the phonological grammar describe speech sounds?
 - Why? What facts about the world is this proposal designed to **describe, predict**, and hopefully **explain**?
- What **implications** does this aspect of our model have for how we **state the rules** we propose when working on an analysis?
- What is the answer to **prep question #1**, about which way of stating rules is better?

3. Testing the predictions of our analysis

- As we develop an analysis of a morpheme alternation in some language — proposing rules that are stated in terms of features — we need to **test the predictions** of our analysis
 - We need to **confirm** that our analysis can accurately **describe** the facts about the world (the data set)
 - We might also want to confirm that our analysis makes plausible predictions in general
 - This becomes easier as we learn more about general patterns in language phonologies

3. Testing the predictions of our analysis

- **How** do we test the predictions of our proposed rules against the data set?
 - Reminder: We did this with our analysis of Dutch

3. Testing the predictions of our analysis

- **How** do we test the predictions of our proposed rule(s) against the data set?
 - Consider what the URs of the words in the data set would be (according to our analysis)
 - Apply our rule(s) in a very literal-minded way to the URs, and confirm that the correct surface forms are derived
- What is the answer to **prep question #2**, about whether we need to include [+hi] in the targets of the rounding and backing rules?

4. Improving on our original set of rules

- How can we make our analysis of the Turkish genitive more **general, simple, and insightful**?
 - Hint: Instead of having 3 rules, we can propose an analysis that needs only 2 rules

4. Improving on our original set of rules

- How can we make our analysis of the Turkish genitive more **general, simple, and insightful**?
 - Rather than “translating” from segments to feature sets, try to be *thinking in terms of features*
- How does this revised analysis actually provide **evidence** that the phonological grammar makes use of features, rather than treating segments as “atoms”?

5. Phonemes and allophones: Introduction

- Some review from LING 101:
 - What is a **phoneme**?
 - What is an **allophone**?

5. Phonemes and allophones: Introduction

- Some review from LING 101:
 - What is a **phoneme**? — mental sound category
 - What is an **allophone**? — surface or “phonetic” pronunciation of a sound
- Some plausible made-up examples for illustration:

Phonemes

/m/

/d/

Allophones

[m]

[d]

[r]

6. Phonemes and allophones: Example

- Some consonant sounds in Spanish [audio in class]
 - (a) What is the initial consonant SOUND?
baño 'bath'
vaca 'cow'
 - (b) What is the medial consonant SOUND ?
Cuba 'Cuba'
uva 'grape'
 - (c) How informative is the spelling here?

6. Phonemes and allophones: Example

- Some consonant sounds in Spanish [audio in class]

(a) What is the initial consonant SOUND?

baño 'bath' — [b] | vcd bilab oral **stop**

vaca 'cow' — [b]

(b) What is the medial consonant SOUND?

Cuba 'Cuba' — [β] | vcd bilab oral **fricative**

uva 'grape' — [β]

(c) How informative is the spelling here?

NOT LETTERS, SOUNDS!

6. Phonemes and allophones: Example

- Question: Is the distribution of [b] versus [β] in Spanish **predictable** or **unpredictable**?
 - How can we figure this out?
 - What factors in the **environment** of these sounds are relevant?

[bino] ‘he came’

[brotar] ‘to sprout’

[imbierno] ‘winter’

[zumbar] ‘to hum’

[diβino] ‘divine’

[uβa] ‘grape’

[kaβo] ‘end’

[suβteraneo] ‘subterranean’

[arβol] ‘tree’

6. Phonemes and allophones: Example

- Question: Is the distribution of [b] versus [β] in Spanish **predictable** or **unpredictable**?
 - The distribution of [b] versus [β] is **predictable**: Given the **environment**, we know which to **expect**
- Should our **model** of the phonology of a language propose that a **predictable** pattern is...
 - stored in the mental lexicon?
 - produced by the phonological grammar?

Why? (And how could we **test** this prediction?)

6. Phonemes and allophones: Example

- The distribution of [b] versus [β] in Spanish is **predictable**
- How we analyze this pattern
 - Although [b] and [β] in Spanish words are phonetically and even featurally different...
 - ...they belong to the **same phoneme** (mental/cognitive sound category)

Phoneme /(?)/ (← How do we decide this?)

Allophones [b] [β]

6. Phonemes and allophones: Example

- What is the connection, in our **model** of phonological grammars, between:
 - phonemes with multiple allophones
 - morphemes that alternate

- We will follow this up next time